

In the Claims:

1. (Currently Amended) A method for producing an ultrasound image, comprising:
generating ultrasound at a frequency of at least 20 megahertz (MHz);
transmitting ultrasound at a frequency of at least 20 MHz into a subject;
receiving ultrasound from the subject, wherein the steps of transmitting and receiving are incrementally repeated from a first scan line position through an nth scan line position;
generating a plurality of scan lines at each scan line position, each scan line being offset in time from a reference point of an ECG rhythm; and
processing the received ultrasound to provide an image having an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction, wherein the scan based image reconstruction comprises assembling the plurality of scan lines based on the scan line position and the point of time offset from the reference point to form an image frame.
2. (Original) The method of claim 1, further comprising generating ultrasound in a frequency range of about 20MHz to 60MHz .
3. (Original) The method of claim 1, further comprising using the ultrasound on a small animal to image rapidly moving anatomy.
4. (Original) The method of claim 3, wherein the small animal is a mouse.
5. (Original) The method of claim 1, further comprising using the ultrasound on a small animal to image blood flow.
6. (Original) The method of claim 5, wherein the small animal is a mouse.

7. (Currently Amended) The method of claim 1, further comprising:

repeating the step of processing to form a plurality of image frames at select times offset from the reference point relative to the ECG rhythm generating a plurality of scan lines, each scan line generated at a specific location and offset in time from a reference point of an ECG rhythm.

8. (Currently Amended) The method of claim 7, further comprising:

time sequencing the plurality of image frames to form a sequence of image frames relative to the ECG rhythm assembling the plurality of scan lines based on the location and the point in time offset from the reference point.

9. (Currently Amended) A system for developing an ultrasound image, comprising:

a scan head having a transducer capable of generating ultrasound energy at a frequency of at least 20 megahertz (MHz); and

a transmit subsystem configured to incrementally transmit ultrasound at a first scan position through an nth scan position and to generate a plurality of scan lines at each scan position, each scan line being offset in time from a reference point of an ECG rhythm; and

a processor for receiving ultrasound energy and for generating an ultrasound image at an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction, wherein the processor is further configured to assemble the plurality of scan lines based on the scan line position and the point in time offset from the reference point to form an image frame.

10. (Original) The system of claim 9, wherein the ultrasound occurs at a frequency range of about 20MHz to 60MHz.

11. (Original) The system of claim 9, wherein the ultrasound is performed on a small animal to image rapidly moving anatomy.

12. (Original) The system of claim 9, wherein the ultrasound is performed on a small animal to image blood flow.

13. (Currently Amended) The system of claim 10, ~~further comprising: a transmit subsystem configured to generate a plurality of scan lines, each scan line generated at a specific location and offset in time from a reference point of an ECG rhythm wherein the processor is further configured to generate a plurality of image frames at select times from the reference point relative to the ECG rhythm.~~

14. (Currently Amended) The system of claim ~~13~~ 10, ~~further comprising: an image reconstruction subsystem configured to assemble the plurality of scan lines based on the location and the point in time offset from the reference point wherein the processor is further configured to time sequence the plurality of image frames relative to the ECG rhythm.~~

15. (Currently Amended) A system for producing an ultrasound image, comprising:
 means for generating ultrasound at a frequency of at least 20 megahertz (MHz);
 means for transmitting ultrasound at a frequency of at least 20 MHz into a subject;
 means for receiving ultrasound from the subject, wherein the means for transmitting ultrasound and the means for receiving ultrasound are incrementally repeated from a first scan line position through an nth scan line position;
 means for generating a plurality of scan lines at each scan line position, each scan line being offset in time from a reference point of an ECG rhythm; and
 means for processing the received ultrasound to provide an image having an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction,

wherein the scan based image reconstruction comprises means for assembling the plurality of scan lines based on the scan line position and the point of time offset from the reference point to form an image frame.

16. (Original) The system of claim 15, further comprising means for generating ultrasound in a frequency range of about 20MHz to 60MHz.

17. (Currently Amended) The system of claim 15, further comprising means for forming a plurality of image frames at select times offset from the reference point of the ~~generating a plurality of scan lines, each scan line generated at a specific location and offset in time from a reference point of an~~ ECG rhythm.

18. (Currently Amended) The system of claim 17, further comprising means for time sequencing the plurality of image frames to form a sequence of image frames relative to the ECG rhythm ~~assembling the plurality of scan lines based on the location and the point in time offset from the reference point.~~

19. (Currently Amended) A method for producing an ultrasound image, comprising:
generating ultrasound in a frequency range of 20-60 megahertz (MHz);
transmitting the ultrasound into a small animal;
receiving the ultrasound from the small animal, wherein the steps of transmitting and receiving are incrementally repeated from a first scan line position through an nth scan line position;

processing the received ultrasound to provide an image having an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction to image rapidly

moving anatomy, wherein the processing further comprises:

generating a plurality of scan lines at each scan line position, each scan line being generated at a specific location and offset in time from a reference point of an ECG rhythm; and

assembling the plurality of scan lines based on the scan line position location and the point in time offset from the reference point to form an image frame.

20. (Currently Amended) A method for producing an ultrasound image, comprising:

generating ultrasound in a frequency range of 20-60 megahertz (MHz);

transmitting the ultrasound into a small animal;

receiving the ultrasound from the small animal, wherein the steps of transmitting and receiving are incrementally repeated from a first scan line position through an nth scan line position;

processing the received ultrasound to provide an image having an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction to image blood flow, wherein the processing further comprises:

generating a plurality of scan lines at each scan line position, each scan line being generated at a specific location and offset in time from a reference point of an ECG rhythm; and

assembling the plurality of scan lines based on the scan line position location and the point in time offset from the reference point to form an image frame.

21. (Currently Amended) A system for developing an ultrasound image, comprising:

a scan head having a transducer capable of generating ultrasound energy in a frequency range of 20-60 megahertz (MHz);

a processor for receiving ultrasound energy and for generating an ultrasound image at an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction;

a transmit subsystem configured to incrementally transmit ultrasound at a first scan position through an nth scan position and to generate a plurality of scan lines at each scan line position, each scan line ~~being generated at a specific location and~~ offset in time from a reference point of an ECG rhythm; and

an image reconstruction subsystem configured to assemble the plurality of scan lines based on the scan line position ~~location~~ and the point in time offset from the reference point to form an image frame.

22. (Currently Amended) A system for producing an ultrasound image, comprising:

means for generating ultrasound in a frequency range of 20-60 megahertz (MHz);

means for transmitting the ultrasound into a subject;

means for receiving ultrasound from the subject, wherein the means for transmitting ultrasound and the means for receiving ultrasound are incrementally repeated from a first scan line position through an nth scan line position;

means for processing the received ultrasound to provide an image having an effective frame rate of at least 200 frames per second (fps) using scan line based image reconstruction, wherein the means for processing comprises:

means for generating a plurality of scan lines at each scan line position, each scan line ~~being generated at a specific location and~~ offset in time from a reference point of an ECG rhythm; and

means for assembling the plurality of scan lines based on the scan line position ~~location~~ and the point in time offset from the reference point to form an image frame.

23. (New) The system of claim 21, wherein the image reconstruction subsystem is further configured to form a plurality of image frames at select times offset from the reference point relative to the ECG rhythm.

24. (New) The system of claim 23, wherein the image reconstruction subsystem is further configured to time sequence the plurality of image frames to form a sequence of image frames relative to the ECG rhythm.

25 (New) The system of claim 22, further comprising means for forming a plurality of image frames at select times offset from the reference point relative to the ECG rhythm.

26. (New) The system of claim 25, further comprising means for time sequencing the plurality of image frames to form a sequence of image frames relative to the ECG rhythm.